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worked up regions by far the larger portion of the Micro-Hymenoptera and Micro-Diptera remain absolutely undescribed in our collections, and have been but very partially collected, it will be safe to estimate that not one-fifth of the species extant have yet been characterized or enumerated. In this view of the case the species in our collections, whether described or undescribed, do not represent perhaps more than one-fifth of the whole. In other words, to say that there are 10,000,000 species of insects in the world, would be, in my judgment, a moderate estimate."

MICROSCOPY.[1]

Gulland's Method of Fixing Paraffine Sections to the Slide.[2]—After pointing out the difficulties arising from the use of the albumen fixative the author offers the following method:

The tissue is imbedded in the usual manner. In trimming the block for sectioning, care must be taken to see that the surface meeting the razor is exactly parallel to the opposite surface; these surfaces are then coated with soft paraffine, and when this has hardened are again trimmed square. The reason for this special care is that any curve in the ribbon produced by neglect of this precaution is accentuated by the later flattening of the sections. When all the sections required have been cut the ribbon is divided into lengths corresponding to that of the cover glass in use.

A flat glass dish filled with warm water is now provided; the temperature should never be high enough to melt the soft paraffine holding the sections together. Short of this, however, the warmer the water the more rapidly and completely are the sections flattened.

The ribbons are seized at one end with forceps while the other end is gently lowered upon the surface of the warm water; as the sections flatten out they will move along the surface of the water; when the flattening is complete the slide, carefully cleaned, is immersed in the water. The ribbon is floated into its position with a stiff brush; this process is repeated until the slide is full, when it is set up on end until the water is thoroughly drained off. The slide is then transferred to the top of the imbedding oven, where the temperature is a little under 50° C., and where, consequently, the paraffine of the sections is not

[1]This department is edited by C. O. Whitman, Chicago University.

[2]Jour. of Anat. and Physiol., Vol. xxvi.

melted, though the water rapidly evaporates. The slides are kept there, with a cardboard cover over them to keep off dust, until the evaporation is complete and the sections adhere to the slide. The time required for this varies according to the thickness of the sections; for thin sections one hour is generally sufficient for complete fixation, but the important point is that *the paraffine must never be melted until the last trace of water has disappeared from the slide.* melted until the last trace of water has disappeared from the slide. If this premature melting happens by any accident the sections are certain to peel off later. A few experiments enable one to be sure of the point when the slides are safe.

After complete fixation the paraffine is melted by putting the slide inside the oven, then washed off with turpentine or xylol.

One of the great advantages of this method is the perfect ease and safety with which it allows sections on the slide to be manipulated, so that the most various stains and reagents can be applied successively to a slide, *e. g.*, the complicated processes used to demonstrate bacteria in the tissues can be applied, with the certainty, moreover, that there is nothing on the slide to be stained which was not in the section.

A Method of Killing Nematodes for Microtome Sections.—Inquiries from several zoologists as to how Nematodes may be prevented from curling while being killed, leads me to publish the following very simple but satisfactory method. This method, so far as I know, was first used by my friend, Dr. Kaiser, in preparing *Echinorhynchus* for the microtome, and I have now used it several years and find it indispensible in fixing Nematodes and other worms.

A worm—only one can be killed at a time—is placed upon a large slide with a few drops of water; a second slide is placed over the worm and moved slowly to and fro. This movement causes the worm to straighten. As soon as the Nematode assumes the desired position the fixing liquid is pipetted between the slides, the motion of the upper slide being continued until the worm is dead. By this method one can obtain a specimen which is perfectly straight and round. If the worm is delicate, too much pressure must not be used during the rolling process. Pressure may be avoided by pasting a piece of paper on the upper surface of the second slide and using that as a handle.

As killing liquid I generally use the following solution: Corrosive sublimate + alcohol 70% + a few drops of acetic acid heated to 50° C., which passes through the cuticle very quickly.—C. W. S.